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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/977,552	10/15/2001	Hank E. Millet	031500487DVA	4193

27572 7590 12/03/2003

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EXAMINER

SAYOC, EMMANUEL

ART UNIT

PAPER NUMBER

3746

DATE MAILED: 12/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

6C

Office Action Summary

Application No. 09/977,552	Applicant(s) MILLET ET AL.
Examiner Emmanuel Sayoc	Art Unit 3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 21 November 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 17-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 17-30 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 15 October 2001 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 a) The translation of the foreign language provisional application has been received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the amendments of 11/21/2003. In making the below rejections and/or objections the examiner has considered and addressed each of the applicants arguments.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. Applicant is instructed to include the most pertinent concepts or components of the claimed invention within the title.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 17-23, and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Centers et al. (U.S. 6, 471, 486 B1) in view of Culp, III et al. (U.S. 5,975,854).

With respect to claim 17, 18, 21, and 29, in Figure 2A, Centers et al. discloses a compressor system and control system comprising a compressor(s) (1002) and an electronic control system(s) (1004), which is analogous to the claimed invention's control block. The electronic control system (1004) is in communication with the compressor (1002). Multiple

compressors (1002) can be controlled at the same time, in which case multiple electronic control systems (1004) are linked via network in a peer to peer configuration – see abstract. A remote computer used for monitoring, controlling, downloading firmware software, and communicating compressor operation data constitutes a system master as in the claimed invention. The remote computer is in communication with the electronic control systems (1004) and is operative to receive stored compressor configuration information from the electronic control system (1004) – see column 25 line 42 to column 26 line 27. Random access memory chips (510) are used for storage of operating data, i.e. compressor configuration information, history data, and parameter calculation results – see column 19 lines 33-37. All operating parameters, service information, shut down records, sensor input information (including temperature and pressure data), are transmitted from the electronic control system (1004) to the system master computer. All of the stored operating parameters of the electronic control system (1004) can be modified by the system master computer – see column 15 lines 5-17.

The Centers device differs from the claimed invention in that there is not explicit teaching of the control block being mounted on the compressor. As stated above the Center's device substantially discloses the control system of the claimed invention. Each compressor within the Center's control system comprises an individual control block. This control block governs the compressor it is assigned to, and interacts with a system mater and other control blocks in a peer-peer system. It is the examiner's position that the exact location of these control blocks does not sufficiently depart from the inventive concept of Centers device. There is no significant difference between placing all the control blocks into one control room, and placing the control blocks on the compressors. Mounting a control block to the compressor it is

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assigned to would be obvious in order to integrate the design of the compressor, reduce control block to compressor wiring, i.e. network set up, and simplify control block to compressor identification.

Culp, III et al. teaches a compressor (10) with a terminal box assembly (28). The box contains within a protection module (86), which is analogous to the claimed invention's control box. The protection module, which includes vibration sensors, power supply circuits, and control circuits (Figure 4 and 7), is mounted on the compressor shell via the terminal box (column 6 line 61-62). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Centers et al. device, by mounting the control block on the compressor, as taught by Culp, III et al., in order to integrate the design of the compressor, reduce control block to compressor wiring, i.e. network set up, and simplify control block to compressor identification.

With respect to claim 19 and 20, the control system uses pressure and temperature sensors, among others, to detect or predict actual shutdown conditions based on the operating state of the compressor (1002). These signals are transmitted to the system master, and are indicative of an operating characteristic of the compressor – see column 9 lines 21-26.

With respect to claim 23, the stored compressor configuration information includes many compressor specific values such as model number/type – see column 27 line 37.

With respect to claim 25, the operating data, or configuration information includes at least one pressure limit, and at least one temperature limit. These limits are used as thresholds that predict abnormal compressor operation – see column 9 lines 10-15 (temperature), and

column 9 lines 35-40 (pressure). The information also includes at least one time limit – column 17 line 33-38.

With respect to claim 26, the control system (1004) includes a microprocessor (500, Figure 2A-1)

With respect to claims 27 and 28, the microprocessor functions as a gateway for communicating with the system master. The various compressor sensors are connected to the control system (1004) via the microprocessor (500) and in turn to the system master wherein information from the compressors (1002) is communicated to the system master via the control system's (1004) microprocessor (500) – see columns 13 line 55 to column 15 line 57.

With respect to claim 30, the Centers et al., as modified by Culp, III et al., device differs from the claimed invention in that there is no disclosure of the system master selectively controlling the control blocks/control systems (1004). It is inherent that individual compressors, with their individual control systems (1004), are selectively controlled by the system master over the network. Compressors undergo different compression situations and the system master must be able to provide independent, and appropriate controls to the compressors.

5. In the alternate, claims 17-23, and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Centers et al. (U.S. 6,471,486 B1), as applied to structures outlined above, and further view of Suzuki (U.S. 5,119,466), with respect to the control block mounting.

The Centers device differs from the claimed invention in that there is not explicit teaching of the control block being mounted on the compressor. As stated above the Center's device substantially discloses the control system of the claimed invention. Each compressor within the Center's control system comprises an individual control block. This control block

governs the compressor it is assigned to, and interacts with a system mater and other control blocks in a peer-peer system. It is the examiner's position that the exact location of these control blocks does not sufficiently depart from the inventive concept of Centers device. There is no significant difference between placing all the control blocks into one control room, and placing the control blocks on the compressors. Mounting a control block to the compressor it is assigned to would be obvious in order to integrate the design of the compressor, reduce control block to compressor wiring, i.e. network set up, and simplify control block to compressor identification.

Suzuki teaches a motor fan blower (Figure 3) with a control circuit assembly (40), which is analogous to the claimed invention's control box. The control circuit assembly, which includes switches, power supply circuits, and control elements (Figure 5), is mounted on the motor case (34) beneath the shroud (35). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Centers et al. device, by mounting the control block on the compressor, as taught by Suzuki, in order to integrate the design of the compressor, and reduce control block to compressor wiring.

6. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Centers et al., as modified by Culp, III et al., as applied to claim 17, and in further view of Friedland (U.S. 5,423,190), and Sunaga et al. (U.S. 6,035,661).

Centers et al., as modified by Culp, III et al., sets forth a device as described above, which is substantially analogous to the claimed invention. The Centers et al., as modified by Culp, III et al., device differs from the claimed invention in that there is no disclosure of the electronic control system (1004) containing compressor configuration information including a

serial number of the compressor, a refrigerant code for the compressor, and an oil code for the compressor. Compressor information such as the model and serial numbers identify the specific parameters (usually provided by the manufacturer), such as intake pressure, discharge pressure, capacity, voltage/current inputs, or operating temperatures. Specific data, that is critical for control system to maintain optimal operation of the compressor is stored in a memory components (538, see column 20 line 52-67). In the same manner the working fluids, whether it be compressed air, gas, refrigerant, or oil need to be specified such that their thermodynamic properties can be specified for the control system. As seen above, Centers et al. anticipated the need for specific compressor parameter information. The properties of the compressor and its working fluid have been specified within the control system either directly, or indirectly through other parameters. Friedland in column 2, line 41-51 and column 6 lines 1-10, teaches the use of a compressor serial number to identify the type of refrigerant and amount of refrigerant used. It is common in compressors to use the refrigerant to lubricate the compressor, in which case refrigerant type would constitute the oil type. There are also cases where oil is mixed with the refrigerant, as is taught by Sunaga et al. in Table 4, and Table 5. Each table identifies a refrigerant and an associated oil. Applying a code to a refrigerant or oil would have been obvious for control scheme identification. Friedland teaches the use of a look-up table. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Center's device by including into the control system (1004) pertinent information such as the compressor serial number, refrigerant code, and oil code, as taught by Friedland and Sunaga et al., for proper identification of the working compressor, its operating fluids, and the thermodynamic properties of its working fluids, using a memory stored look-up table.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited to further show the state of the art with respect to compressor control and protection systems.

U.S. Pat. 5, 713, 724 to Centers et al.

U.S. Pat. 4, 502, 842 to Currier et al.

U.S. Pat. 5,641,270 to Sgourakes et al. – teaches programming lookup tables in memory

U.S. Pat. 6,276,901 B1 to Farr et al. – teaches control block on compressor

U.S. Pat. 6,129,527 to Donahoe et al. - teaches control block on compressor

Response to Arguments

8. Applicant's arguments, see paper 11, filed 11/21/2003, with respect to the rejection(s) of claim(s) 17-23 and 25-30 under 35 U.S.C. 102(e), and claims 24 and 30 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Centers et al., Culp III, et al., Sunaga et al., and Friedland.

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Sayoc whose telephone number is (703) 305-0054. The examiner can normally be reached on M-F 8 A.M. - 6 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Justine Yu can be reached at (703) 308 2675. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9302.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0861.



Emmanuel Sayoc
Examiner
Art Unit 3746

ECS



JUSTINE R. YU
PRIMARY EXAMINER

12/11/03